

## Inhibition effects of adipocyte differentiation by aqueous extracts of Nanji- and Hanji-garlic on 3T3-L1 cells

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### Abstract

The murine 3T3-L1 preadipocyte cell line represents one of the most well-characterized in vitro models currently used to study adipocyte differentiation<sup>1</sup>). Of the beneficial effects of garlic on serum lipids, fibrinolysis, platelet aggregation, blood pressure and antioxidants properties, the present study focuses on the lipid metabolism. The purpose of this study was to investigate the inhibitory activity of aqueous extracts of Nanji- and Hanji-garlic on the adipogenic differentiation of 3T3-L1 cells at the cellular level. The differentiation of 3T3-L1 cells into adipocytes was initiated by the addition of 0.25uM dexamethasone, 0.5mM 3-isobutyl-1-methyl xanthine and 10 $\mu$ g/ml insulin to the culture medium of confluent cells(day 0) for 2 days. Cells were fixed and stained with Oil Red O to assess lipid accumulation. Aqueous extracts of garlic(0.0625, 0.125, 0.25, 0.5 and 1mg/ml) was added to the cells from 2 days of culturing system to investigate its effect on cell differentiation. Total lipid and triglyceride contents increased during the cell differentiation. The aqueous extracts of garlic inhibited the accumulation of triglyceride droplets and the effect of garlic was dose-dependent. The activities of glycerophosphate dehydrogenase(GPDH), a marker of adipose differentiation, was affected by the aqueous extracts of Nanji- and Hanji-garlic. These results suggest that aqueous extracts of garlic may have an inhibitory role on the early stage of 3T3-L1 cell differentiation.

### **Reference**

1. G. ELBERG, J. M. GIMBLE, & S. Y. TSAI, Modulation of the murine peroxisome proliferators-activated receptor  $\alpha$  promoter activity by CCAAT/enhancer-binding proteins. (2000), *J Biol Chem* 275, 27815-27822.